

Appendix K.

Validation Criteria for Air Monitoring Data

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Air Quality Monitoring Program
Yerington Mine, Yerington, Nevada

Parameter	Method	PQL ⁽¹⁾ (µg)	MDL (µg)	LCS Control Limits	
				Recovery (%)	RPD ⁽²⁾ (%)
PM ₁₀	EPA IO-2.1	100	N/A	N/A	N/A
Arsenic	SW846-6020	2.0	0.50	75-125	20
Barium	SW846-6020	1.0	0.50	75-125	20
Cadmium	SW846-6020	1.0	0.20	75-125	20
Chromium	SW846-6020	2.0	0.50	75-125	20
Lead	SW846-6020	1.0	0.20	75-125	20
Mercury	SW846-7471A	0.2	0.0001	75-125	20
Selenium	SW846-6020	2.0	0.15	75-125	20
Silver	SW846-6020	1.0	0.20	75-125	20

Parameter	Method	MDA (pCi)
Thorium (228, 230, 232)	HASL-300	1.008
Radium 226	EPA 903.1M	1.008
Radium 228(b)	EPA 904.0M	3.12
Gross Alpha	HASL-300	19.92
Gross Beta	HASL-300	0.6
Uranium (234, 235, 238)	HASL-300	1.008

Notes:

(1) = maximum acceptable PQL

(2) = RPD limit includes laboratory duplicates

LCS = laboratory control sample

MDA = minimum detectable activity are isotope dependent based on a 60 min counting time.

MDL = method detection limit

µg = microgram

N/A = not applicable

pCi = picoCuries

PQL = practical quantitation limit

RPD = relative percent difference

METHOD 6020 METALS ANALYSES QA/QC CRITERIA

QUALITY PARAMETER	METHOD/ FREQUENCY	CRITERIA	CORRECTIVE ACTION
Instrument Tune	Daily, prior to calibration and sample analysis	Mass resolution < 1.0 amu @ 10% peak height and mass calibration 0.1 amu.	Retune instrument. Repeat tune solution and analysis.
Initial Calibration	Laboratory mixed standard calibration	Correlation coefficient: 0.995	Evaluate system. Recalibrate.
Calibration Blank	After initial calibration and each continuing calibration	< PQL	Rerun. Clean system. Reanalyze affected samples.
Initial Calibration Verification (ICV)	After calibration	10% of expected response	Reanalyze ICV. Recalibrate.
Continuing Calibration Verification (CCV)	Every 10 samples and end of run sequence	10% of expected response	Reanalyze. Recalibrate. Reanalyze samples.
Method Blank	1 per analytical batch	<PQL (RL)	Reanalyze. Recalibrate as necessary.
Internal Standard	Each sample	30-130 %	Reanalyze and/or narrate.
Duplicate Control Sample (DCS)	1 per analytical batch	See included table for specific analytes	Check calculations. Assess impact on data. Narrate.
Holding Time		Days to analysis: 180	

STL Reference Data Summary

Structured Analysis Code: S-2A-MH-3W-07

Target Analyte List: SAC: Multiple Metals (Ex. Hg)-AIR

Matrix: AIR
Extraction: PM-10 Filter Metals Digestion
Method: Inductively Coupled Plasma Mass Spectrometry(6020)
QC Program: AMBIENT AIR TESTING
Location: STL Sacramento

Target List 20954				Check List 20962				Spike List 20963			
Syn	Compound	RL	Detection Limits Units MDL	Units	Run Date	T A Amt	Units	LCL UCL RPD	T A Amt	Units	LCL UCL RPD
88	Aluminum	50.0	ug 22	ug	19980609	C Y 1000	ug	78 118 15	C Y 1000	ug	78 118 15
128	Antimony	2.0	ug 0.16	ug	19980609	C Y 50	ug	81 105 15	C Y 50	ug	81 105 15
140	Arsenic	2.0	ug 0.41	ug	19980609	C Y 200	ug	82 105 15	C Y 200	ug	82 105 15
194	Barium	1.0	ug 0.43	ug	19980609	C Y 200	ug	86 109 15	C Y 200	ug	86 109 15
222	Beryllium	1.0	ug 0.11	ug	19980609	C Y 200	ug	79 105 15	C Y 200	ug	79 105 15
411	Cadmium	1.0	ug 0.10	ug	19980609	C Y 200	ug	82 105 15	C Y 200	ug	82 105 15
2952	Chromium	2.0	ug 0.35	ug	19980609	C Y 200	ug	81 114 15	C Y 200	ug	81 114 15
637	Cobalt	1.0	ug 0.10	ug	19980609	C Y 200	ug	80 119 15	C Y 200	ug	80 119 15
643	Copper	2.0	ug 0.15	ug	19980609	C Y 200	ug	86 112 15	C Y 200	ug	86 112 15
1605	Lead	1.0	ug 0.15	ug	19980609	C Y 200	ug	84 114 15	C Y 200	ug	84 114 15
1659	Manganese	1.0	ug 0.14	ug	19980609	C Y 200	ug	82 119 15	C Y 200	ug	82 119 15
1956	Nickel	2.0	ug 0.12	ug	19980609	C Y 200	ug	85 113 15	C Y 200	ug	85 113 15
2200	Phosphorus	50.0	ug 50.0	ug	19981222	C Y 1000	ug	80 120 20	C Y 1000	ug	80 120 20
2281	Selenium	2.0	ug 0.12	ug	19980609	C Y 200	ug	80 105 15	C Y 200	ug	80 105 15
2285	Silver	1.0	ug 0.10	ug	19980609	C Y 50	ug	84 110 15	C Y 50	ug	84 110 15
2477	Thallium	1.0	ug 0.10	ug	19980609	C Y 50	ug	87 119 15	C Y 50	ug	87 119 15
2607	Vanadium	10.0	ug 0.34	ug	19980609	C Y 200	ug	77 116 15	C Y 200	ug	77 116 15
2649	Zinc	5.0	ug 1.1	ug	19980609	C Y 200	ug	84 105 15	C Y 200	ug	84 105 15

METHOD 7471A (Mercury) QA/QC CRITERIA

QUALITY PARAMETER	METHOD/ FREQUENCY	CRITERIA	CORRECTIVE ACTION
Initial Calibration	Blank and five standards. Daily before analysis	Correlation Coefficient 0.995	Evaluate system. Recalibrate.
Calibration Blank	After initial calibration and each calibration	< PQL ¹	Rerun. Clean system. Reanalyze affected samples.
ICV	After calibration	80-120%	Reanalyze ICV. Recalibrate.
CCV	Every 10 samples and end of run sequence	80-120%	Reanalyze. Recalibrate. Reanalyze affected samples.
Method Blank	1 per analytical batch	< PQL ¹	Reanalyze. Recalibrate as necessary. Reanalyze.
Duplicate Control Sample (DCS)	1 per analytical batch	80-120% (aqueous)	Check calculations. Re-extract and reanalyze as necessary. Assess impact on data. Narrate.
Holding Time		Days to analysis: 28	

¹ The term PQL refers to the laboratory's standard Reporting Limit.

STL Reference Data Summary

Structured Analysis Code: S-2A-09-3W-07

Target Analyte List: All Analytes

Matrix: AIR
 Extraction: PM-10 Filter Metals Digestion
 Method: Mercury (7471A, Cold Vapor) - Solids
 QC Program: AMBIENT AIR TESTING
 Location: STL Sacramento

Analyte List	Syn Compound	RL	Detection Limits		Run Date	Check List 20978		Spike List 20979	
			Units	MDL		Units	MDL	Units	MDL
1701	Mercury	0.2	ug	0.00006	19980126	C Y 3.0	ug	80 120 20	C Y 3.0
								ug	80 120 20

Appendix L.

Validation Criteria for Meteorological Data

Variable	Screening Criteria (flag data if the value meets one of the following)
Wind Speed	<ul style="list-style-type: none">▪ Less than zero or greater than 25 meters per second (m/s)▪ Does not vary by more than 0.1 m/s for 3 consecutive hours▪ Does not vary by more than 0.5 m/s for 12 consecutive hours
Wind Direction	<ul style="list-style-type: none">▪ Less than zero or greater than 360°▪ Does not vary by more than 1 degree for more than 3 consecutive hours▪ Does not vary by more than 10 degrees for 18 consecutive hours
Temperature	<ul style="list-style-type: none">▪ Greater than the local record high▪ Less than the local record low▪ Greater than a 10 °C change from the previous hour▪ Does not vary by more than 0.5 °C for 12 consecutive hours
Solar Radiation	<ul style="list-style-type: none">▪ Greater than zero at night▪ Greater than the maximum possible for the date and latitude
Barometric Pressure	<ul style="list-style-type: none">▪ Greater than the local record high▪ Less than the local record low
Humidity	<ul style="list-style-type: none">▪ Less than 30% during precipitation events▪ Varies by 30% of the local average for 24 consecutive hours